



INNOVATION STRATEGY RHINELAND-PALATINATE

Short version



THE COUNCIL OF MINISTERS OF RHINELAND-PALATINATE
RESOLVED THE INNOVATION STRATEGY RHINELAND-PALATINATE
ON 13 MAY 2014

The Innovation Strategy Rhineland-Palatinate represents the regional strategy for fulfilment of *ex ante* conditionality governing the Rhineland-Palatinate Operational Programme for the European Regional Development Fund (ERDF) in the funding period 2014 to 2020, pursuant to Article 9, Paragraph 1, No. 1 and Annexe XI, No. 1.1 of EU Regulation 1303/2013 on European Structural and Investment Funds (ISIF).

0 EXECUTIVE SUMMARY

Innovations are the means by which the latest knowledge gained from science and technology is turned into marketable products, processes and services. They are crucial drivers of investment, productivity, employment and competitiveness. Innovations through technical progress offer vital growth opportunities and form the foundations of economic strength.

In its innovation policy, Rhineland-Palatinate is pursuing a systematic and consistent approach to strengthening the innovative power of its businesses and the performance of its universities, universities of applied sciences and research institutes, as guarantors of a further improvement in the competitiveness of the Rhineland-Palatinate economy as a central aim.

The Innovation Strategy Rhineland-Palatinate brings together the strategic approaches taken by the State of Rhineland-Palatinate in pursuit of its innovation policy, to form one holistic approach. The Innovation Strategy Rhineland-Palatinate is linked at national level with the German Federal Government's high-tech strategy, and as regards the European level it is embedded in the EU 2020 Strategy.

The Innovation Strategy Rhineland-Palatinate has been developed in the course of an intensive working process, with multiple participation by representatives of academic research, business, administration and government, building on the State's previous strategic innovation-policy approaches. It represents an action framework for future activity by the State Government pursuant to its innovation policy. This particularly includes support from the European Regional Development Fund (ERDF) for the period 2014-2020, which defined a regional innovation strategy as an ex-ante conditionality of ERDF support for research, technology and innovation.

The Innovation Strategy Rhineland-Palatinate focuses on the potentials available and on the strengths existing in the State, support for which will reflect the opportunities offered by global megatrends and by the latest lead-market and technological developments, while paying regard to social and economic challenges, e.g. climate protection and resource efficiency. Taking a "smart specialization" approach, this innovation strategy is addressed primarily to the high-potential areas with the greatest regional competitive advantages and most unique characteristics. In central points of action under this innovation policy, support work and support tools will be directed primarily to these high-potential areas. This will be based on a joint vision for developing an innovative region.

Given the dynamic nature of technological and scientific development, and of changing markets, the Innovation Strategy will be further developed and implemented utilizing a profound monitoring process and in dialogue with the innovation stakeholders in business and science.

STRATEGIC APPROACH

The Innovation Strategy pursues the **vision**, jointly with all players in the regional innovation system, of developing Rhineland-Palatinate further into one of the leading innovation regions in Europe. The backbone for this will be innovative and successful businesses – particularly small and medium-sized enterprises (SME), to provide the very cornerstone – and research institutions with a high profile both nationally and internationally.

The **overarching aim** of the Innovation Strategy Rhineland-Palatinate is to strengthen the innovative power and competitive position of Rhineland-Palatinate. **Five strategic aims**, interlocking in a holistic approach along the innovation chain, will put this objective into practice:

- Research and technological development at universities, universities of applied sciences and research institutes will remain central for Rhineland-Palatinate as a region of innovation and shall therefore be strengthened and constantly developed further.
- The innovative performance of the economy shall also be raised. In particular, SMEs shall expand their R&D projects through targeted support and accelerate the market launch of their inventions.
- With this in mind, an intensification of knowledge & technology transfer will be a vital aim of the Innovation Strategy Rhineland-Palatinate, in order – using existing expertise – to contribute to a knowledge-based development of the economy.
- The Innovation Strategy will likewise address facilities for business start-ups in Rhineland-Palatinate: the aim is to help increase readiness to make such start-ups and to improve the potential for a technology driven foundation of enterprises. Finally, it is the task of the Innovation Strategy to support collaboration, networking and innovative capability in Rhineland-Palatinate through encouragement of networks and clusters.

These five strategic aims will be supplemented by three **cross-sectional goals** of overarching importance:

- Support of environmental technology, including innovations for climate protection and for raising sustainability and resource efficiency in the economy;
- Availability of suitable professional staff and human capital as a basic precondition for scientific, technological and economic success;
- Support of key technologies based on their ability to create knowledge which will impact on various areas of application and various sectors of industry.

Closely linked with these strategic aims is Rhineland-Palatinate's **funding philosophy** within the Innovation Strategy, comprising the following elements:

- Dialogue orientation and equal opportunities
- Openness to industry and technology
- Quality orientation and leverage effects
- A broad understanding of innovation and the culture of innovation
- Stimulating cross-innovation
- Key technologies as enablers
- Multi-level cluster policy approach (bottom-up)
- Strengthening competitiveness in science and industry
- Strengthening entrepreneurial growth processes
- Close cross-border collaboration

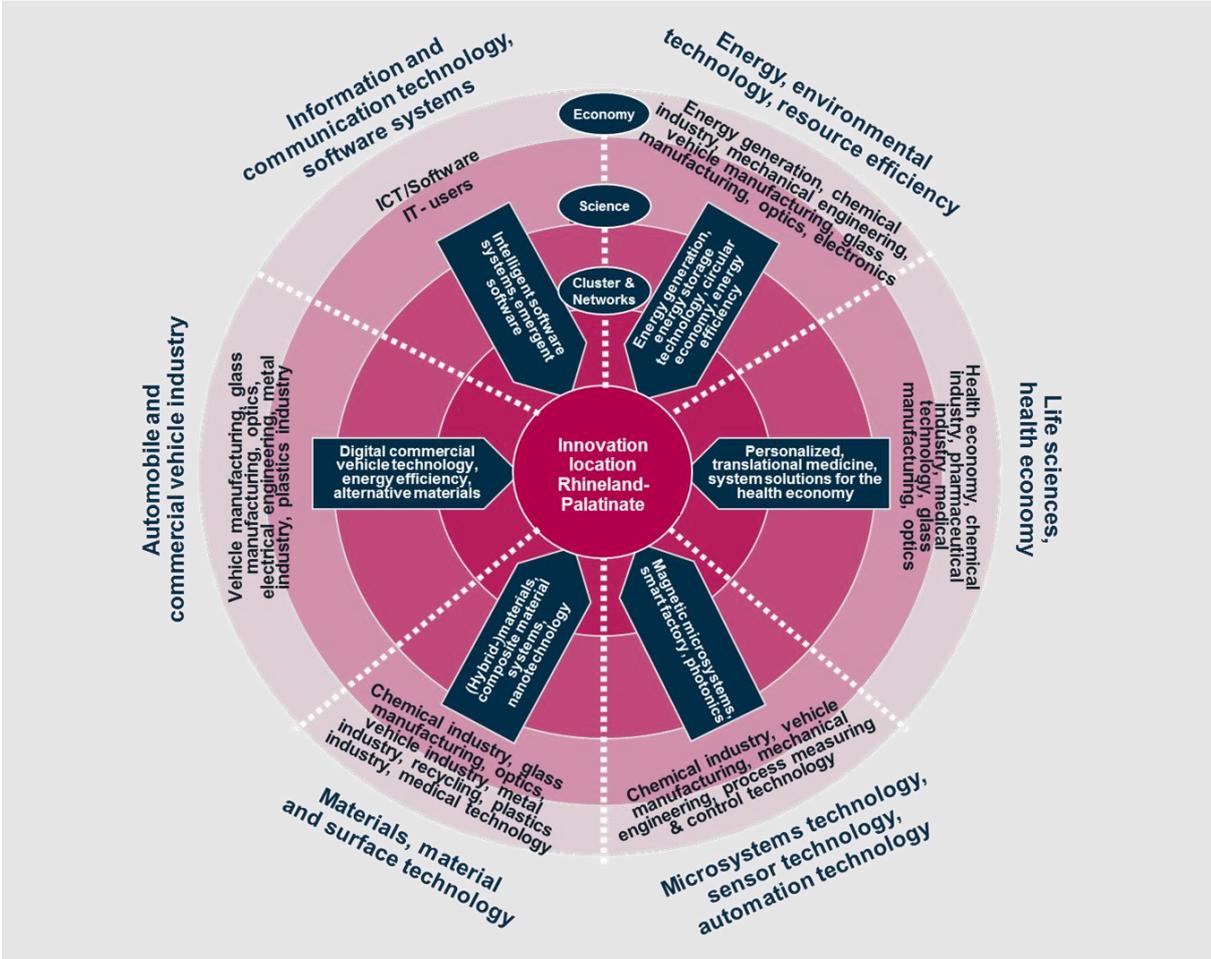
HIGH-POTENTIAL AREAS FOR RHINELAND-PALATINATE AS A CENTER OF INNOVATION

Over the last few years Rhineland-Palatinate has seen its innovative capacities grow and is now half-way up the league table among the German states. At European level, in the Regional Innovation Scoreboard, the state comes in the second-highest group, that of "Leaders of innovation – middle." Based on the general strengths of the innovation system in Rhineland-Palatinate, its comprehensive regional and local expertise in science and industry, and its formation of networking structures, six specific **high-potential areas** have been identified in a multi-stage evaluation process, for Rhineland-Palatinate as a center of innovation. These have been identified using the following criteria:

- Strategic relevance of the high-potential area (megatrends, lead markets, industrial potential)
- Expertise in industrial and scientific research and development
- Formation of cluster & network structures
- Expertise and potential in key and cross-sectional technologies
- Application markets and relevance for areas of social need.

Through their cross-sectional character these high-potential areas stimulate innovations in numerous industries (cross-innovation) and facilitate possibilities of diversification into new or further markets. Figure 1 gives an overview of those high-potential areas which have been identified.

Figure 1: The six high-potential areas in the Rhineland-Palatinate Innovation Strategy – an overview



Source: Prognos AG 2013

Notes:

- Outer rim: high-potential areas
- Inner rim: list of structurally significant industries in Rhineland-Palatinate
- Centre: brief description of current core Rhineland-Palatinate expertise in these high-potential areas

The definition and description of the high-potential areas is based on a primarily economic approach. Allocations to high-potential areas refer to the terms used in the 2008 Classification of Trades and Industries.

High-potential area “life sciences and health economy”

Life sciences and health economy, with their core industries of pharmaceutical industry, chemical industry, medical technology and provision of medical services in Rhineland-Palatinate, form a high-potential area representing a large market, with far above-average growth. The State's particular expertise in research and innovation is based on its capacity in fields of basic research (including immunology, oncology, cardiovascular research, neurology and natural materials), application-related research (particularly protein analysis, optical technologies, laser technology, measurement and sensor technology), and training

facilities for new entrants to professional occupations (including biotechnology, optics, laser technology and applied life sciences). These are supplemented by non-university research institutes, e.g. in diagnostics and cancer therapy or diseases of the immune system. A high level of expertise in research and innovation exists additionally in the industrial sector, extending from large multinationals to innovative start-ups and SMEs. Multifaceted cluster and network structures provide stimulus to the development of value-creation linkages and collaborative innovation ventures. Thus the players in this high-potential area are addressing numerous markets with great relevance to the future, including medical technology, personalized medicine, telemedicine, ambient assisted living, diagnostics and therapy, drug research and development, bioinformatics and bio-analytics and system solutions for the health economy.

High-potential area “energy, environmental technology, resource efficiency”

Environmental technology, with its lead markets of environmentally friendly energy generation and energy storage and circular economy, already makes a major contribution today to the economy of Rhineland-Palatinate and is developing dynamically. Its numerous institutes of basic and application-related research are engaged, among other subjects, in software systems for intelligent energy distribution and energy storage technology, development of lithium-ion batteries, micro-technology and composite materials in energy systems (plastic and lightweight construction), and in geothermal resource management. Thus research in Rhineland-Palatinate provides major incentives towards innovation for the global energy revolution. In the business sector, too, the State has well proven areas of expertise in innovation: the manufacture of special materials and plastics and components for solar-plant construction and project management for renewable energy-supply systems being just two outstanding examples. Rhineland-Palatinate brings this expertise to bear on markets such as energy storage technologies, industrialization of storage systems and virtual power plant, all of which will be of major importance if the energy revolution is to be successful in Germany and Europe. Moreover, environmental technology is significant in particular for the following application markets: water and sewage treatment; energy efficiency in industry, on commercial premises and in industrial-production processes; circular economy (e.g. recovery of precious metals, particularly from electrical and electronic scrap); and the treatment and commercial exploitation of biomass.

High-potential area “microsystems technology, sensor technology, automation”

Microsystems technology, sensor technology and automation technology form a high-potential area which not only shows high growth rates but also touches on a wide range of applied fields, whether in the

automobile and commercial vehicle sector, in medical technology, in optical technologies, or in the information and communications sector. As a region of research, Rhineland-Palatinate is home to a range of institutions with a high expertise profile, including expertise in such fields as intelligent sensor and automation technologies, regulation systems and system technology, ultrafast photonics, materials characterization and materials testing, micro technology for analytics and sensor technology, and nanotechnology. Along with this go numerous research, development and application processes, in both major plant-construction and material-production companies and in highly innovative SMEs, engaged e.g. in weighing technology, laser technology, and robot systems. This is complemented by specialized networks bundling the key players in this high-potential area. Strong stimulus are emerging for Rhineland-Palatinate from numerous application markets, in which magnetic micro-systems, laser components, laser materials processing, process measuring and control technology, embedded systems and applications for additive manufacturing/smart factories (Industry 4.0 / Industrial Internet) play a major role.

High-potential area “automobile and commercial-vehicle industry“

Given the development of sustainable mobility systems, the automobile and commercial-vehicle industry is a high-potential area of great importance, both economically and technologically. The State's relevant expertise in application-led research and applied research are reflected *inter alia* in the existence of front-ranking research institutions, working in such fields as energy and resource efficiency, lightweight construction, virtual and lifecycle-related development, right up to production and maintenance. They are supplemented by centers of expertise at universities and universities of applied sciences and transfer-relevant non-university research institutions. As a complement to all this, well-known companies in the automobile and commercial-vehicle industry research, test and manufacture at numerous locations in Rhineland-Palatinate, supported by many innovative suppliers, working in such fields as laser-welding automation, plastics and materials or components and component parts. Collaboration networks and clusters act as multipliers here, working together on issues such as location marketing and export-market development.

High-potential area “information and communication technology, software systems“

Information and communications technology (ICT) and (intelligent) software systems are among the central forces driving innovation: in Germany today a major proportion of capital investment in the automobile and commercial vehicle sector, medical technology and logistics is already ICT/software driven. Around one third of average annual growth in gross value creation is due to digitalization alone.

In this process Rhineland-Palatinate acts as a major player in Europe's greatest "software cluster" for ICT and software systems in the South-West German business scene. Rhineland-Palatinate is home to excellent research institutions with a high level of expertise in such fields as intermedia and speech design, decentralized network systems, industrial software and system development, simulation of technical processes, modelling and embedded intelligence, from which incentives for development emanate into the economy. Businesses in Rhineland-Palatinate also have major expertise in development and innovation covering various applied fields of ICT, and particularly business software. Work with a focus on application markets is currently underway in a number of fields: business software, ambient intelligence, IT security/safety and security/safety technologies, digital commercial vehicle technology, and power-grid management. And in the field of big data, the "material of the future", major expertise exists in Rhineland Palatinate.

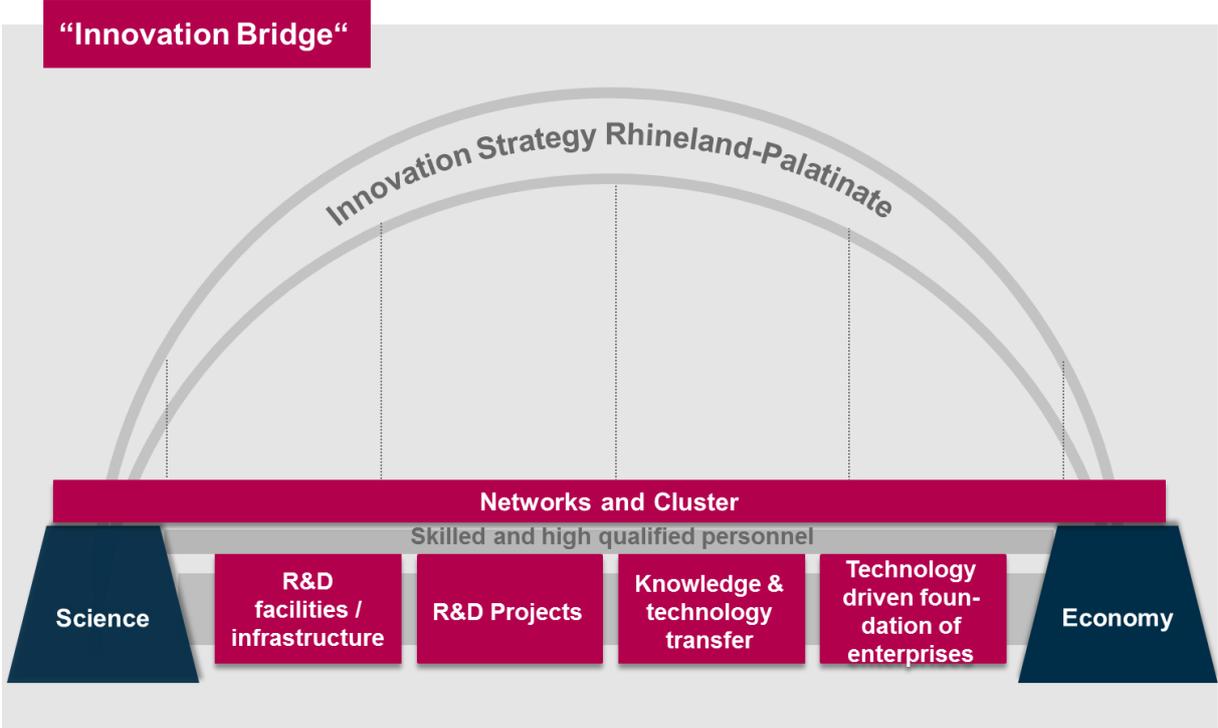
High-potential area “materials, material and surface technology“

Innovative basic materials and material and surface technologies are a driving force for industrial product developments in many sectors. In this high-potential area, too – an area of great economic relevance – Rhineland-Palatinate possesses a diversified industry-specific portfolio with a strong material industry extended by well-positioned material surface-technology industries, such as rubber and plastics industries, metal industry, surfaces and technical ceramics, and the chemical industry. The work of numerous research institutes is devoted to corresponding fields of both basic and application-related research. To name but a few examples: optical technologies and material sciences, ceramic science and engineering, composite materials, instrumental surface analysis, mineral and metal materials, precious stones, precious metals and photonics. The business sector in Rhineland-Palatinate exhibits a differentiated portfolio of large and small companies with a high level of research expertise, e.g. in the technological fields of systems and nanotechnology (including polymer materials and fiber-reinforced polymer composites), special glass, metal, plastic and ceramics, and fiber-composite materials. Network and cluster structures bundle expertise from business and research and strengthen innovative capacities. Thus, the players in Rhineland-Palatinate serve a broad range of markets, including composite materials, functional surface applications, composite material systems and materials substitution, joining technology, materials processing and coating in conjunction with design expertise, filter technology, refractories technology, and technical ceramics.

FIELDS OF ACTION

Building on the strategic aims, to strengthen Rhineland-Palatinate as a center of innovation and to develop it further, five fields of action have been developed, which are organized along the Rhineland-Palatinate innovation bridge model (see Figure 2).

Figure 2: Updated innovation bridge model in Rhineland-Palatinate



Source: Prognos AG 2013

The general measures and approaches summarized in the fields of action aim at expanding potential in the State. Existing bottlenecks within innovation processes are to be removed. At the same time, it is planned to utilize intelligently the potential offered by synergies between the fields of action, in order to maximize the effects for Rhineland-Palatinate. In this process the focus currently lies on the six high-potential areas set out in Figure 1, with their challenges and opportunities, and on new or updated areas to be developed in dialogue.

R&D facilities/infrastructure

Strong R&D facilities in conjunction with a strong R&D infrastructure, through their constant production of new knowledge, form a basis for innovations and the expansion of technological specialization. They comprise all institutions of higher education and research institutes, including their capacities, areas of expertise and profiles. With its institutions of higher education and non-university research institutes, the State of Rhineland-Palatinate is well endowed with the foundations of both basic and application-related research, which needs constant further development of its staff and technological facilities if it is to cope with its function in the innovation process Rhineland-Palatinate. This being so, the State is supporting the competitiveness of its universities, polytechnics and R&D institutes through profile formation of selected focal activities. In further developing R&D facilities/infrastructure, the support will be guided in particular by the challenges and needs of the six high-potential areas. Rhineland-Palatinate also places great expectations on secure basic finance by the Federal German Government and States. In this way strongly-innovative research institutes will be more independent of project grants and at the same time strengthened in their competition for EU funds. To ensure a high level of performance and a sustained development of expertise in application-related research, the Innovation Strategy Rhineland-Palatinate will support the use of various tools to promote staff capacity and technical infrastructure. In addition, support will be given to increase and expand services for small and medium-sized enterprises, to make it easier for them to access the strong application-related areas of scientific expertise in Rhineland-Palatinate.

Research and development projects

Both businesses and scientific institutions are central players when it comes to innovations: through joint ventures and continual work by businesses to turn new ideas, new knowledge and new technologies into marketable products, services or business models, they play a crucial role in stimulating strongly knowledge-based development at their location. Yet the innovative power of a mainly medium-sized-business economy faces the structural challenge of small company sizes and low research and development capacities. The Innovation Strategy Rhineland-Palatinate will therefore use a set of support tools to help build up the entrepreneurial sector's innovation capacity. This approach to innovation promotion envisages support for ambitious research and technology projects at individual-business level. In tandem with this, financial support will be increased for evaluating the technical viability of research and development projects, as well as carrying out pilot and demonstration projects. This will help to reduce costly risks of R&D projects and will support companies in opening up markets for new technologies. This

aim will also be pursued through improvement to innovation-supporting consultancy and other services. Moreover, the Innovation Strategy lays great weight on further, target-group oriented development of joint research – i.e. collaborative, increasingly interdisciplinary research projects in advance of competition, by partners from scientific institutes and from businesses. This will be important for the transfer of latest scientific knowledge and will encourage the development of regional knowledge networks for future collaboration.

Knowledge and technology transfer

Efficient and needs-oriented transfer processes in the regional innovation system make it possible to translate the results of new research rapidly into commercial exploitation. The Innovation Strategy Rhineland-Palatinate will therefore accelerate a further qualitative development of structures for knowledge and technology transfer and encourage support for processes of exchange, particularly in the state-specific high-potential areas. The expansion of inter-state collaboration and communication platforms (e.g. presentations at leading international trade fairs) and the establishment of transfer managers in specific high-potential areas in the state shall make major contributions to this. By means of direct staff support for SMEs, moreover, ideas which are the province of particular individuals may successfully be exchanged more thoroughly. The State will also work to improve efforts at marketing innovations through targeted use of promotional tools. The potential for innovative products, processes of business ideas emerging from our institutions of higher education will be identified with the aid of specific information processing.

Technology driven foundation of enterprises

A ready capacity for business start-ups in innovative and technology-oriented sectors will accelerate regional competitiveness, by helping to change the structure of the economy, helping to raise competitiveness, and helping to embed the region in future growth markets. As stimulators of creative ideas, innovations and local value-creation, new-business start-ups therefore represent a major action point in Rhineland-Palatinate. Building on a well-developed start-up infrastructure, the State will endeavor to increase the number of start-ups at a sustained level. To do this, it will be necessary to raise people's readiness to found knowledge-intensive start-ups. The Innovation Strategy will therefore accelerate the targeted development of start-up and innovation centers, to further improve what the start-up infrastructure can offer. In addition, technology driven foundation of enterprises will be systematically supported, for instance via further development of facilities for encouraging start-up awareness and

qualifications, directed particularly to students, graduates, doctoral candidates, professors and academic assistants. Given the heavy risks of the start-up stage, moreover, provision of venture capital for founders and SMEs in an Innovation Fund will also receive due emphasis, supplemented by such measures as targeted mobilization of private capital via strengthened collaboration with business angels in support networks.

Networks and Clusters

An integrative component of the Innovation Strategy is the State's Cluster Strategy. The Cluster Strategy pursues a multi-level approach, subdivided into four development stages – initiatives, platforms, networks and clusters. While initiatives are understood ideally to mean an initial collaboration by players from research, industry and government, at every further development level *inter alia* the intensity and quality of the networking among the players increases. The bundling of knowledge and expertise, both geographically and by subjects, represents a tried and tested tool for optimizing and accelerating innovation processes. In regional networks and clusters complementary players from selected industries enter into a close networking relationship along the value added chain, both with each other and with supporting players, thus forming a critical mass for the stimulation of innovation processes.

Rhineland-Palatinate already has excellent innovation clusters of supra-regional visibility. Moreover, a multitude of initiatives, platforms and networks are currently contributing to the ability of Rhineland-Palatinate to innovate. These may represent starting points for new clusters, or they may supplement existing ones. Various support tools will therefore be working in future towards strategic, needs-oriented (further) development and to the strengthening of networks and clusters. These are including the establishment and expansion of network and cluster structures, e.g. via ideas-based state backing of existing clusters, a share in kick-off financing for new cluster initiatives, or the opening up of cross-cluster potentials. Professional service and management structures for cluster development will also be strengthened.

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Ministry of Trade & Industry, Climate protection, Energy and State Planning

Stiftsstrasse 9
55116 Mainz
Tel.: 06131/16 -0
www.mwkel.rlp.de

Ministry of Education, Science, Further Training and Culture

Mittlere Bleiche 61
55116 Mainz
Tel.: 06131/16 -0
www.mbwwk.rlp.de

Personal contacts:

Ministry of Trade & Industry, Climate protection, Energy and State Planning (lead management)

Innovation Department
Richard Ortseifer
Stefanie Nauel

Ministry of Education, Science, Further Training and Culture

Research & Technology Department
Godehard Kling
Dr. Thorsten Gluth



Dr. Klaus Sauerborn
Oliver Mühlhan
Kerstin Warncke



Dr. Olaf Arndt
Dr. Jan-Philipp Kramer

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MINISTERIUM FÜR
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ENERGIE UND
LANDESPLANUNG



Rheinland-Pfalz

MINISTERIUM
FÜR BILDUNG, WISSENSCHAFT,
WEITERBILDUNG UND KULTUR

Stiftsstraße 9
55116 Mainz

poststelle@mwkel.rlp.de
www.mwkel.rlp.de

Mittlere Bleiche 61
55116 Mainz

poststelle@mbwwk.rlp.de
www.mbwwk.rlp.de

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